Course: Special Operations Command (SOCOM) Special Operations Forces (SOF) Deployable Node (SDN) Baseline
Module: Modem Theory and iDirect Platform
Document: Remote Options Files Descriptions and Configuration Data
Updated: 06/01/6015

Options File Configuration Data

This document contains descriptions and configuration data for important aspects of options files.

NOTE: All IP addresses are used for training purposes and do not reflect real-world IP addresses.

Options File contains 4 key aspects:

- Modem_sn: Should reflect the correct serial number
- Modem_type: Should either be point to point, SCPC or most likely TDMA
- Modem_hardware: Should reflect the correct type of modem being used
- did: Should reflect the correct DID corresponding the modem serial number (The "did" can be found by hyper-terminaling into the modem and typing "DID.")

[OPTIONS_FILE]

modem_sn = 64712
modem_type = Pnt_To_Pnt
modem_hardware = 5150
did = 6094024
generated_by = $Name: NetModem-8_0_2_5 $
is_mesh = 0
disable_options_flash_command = 0

SECURITY tells the modem the password (typically set as "P@55w0rd! or in older modems "iDirect!"), and the administrator's password.

[SECURITY]

password = $idi2$.d....$6vX2XCwBMgTqAYHsUI1PXtRA84q
admin_password = $idi2$.XG...$BJv5ktS.A2Pno.qM/ZLMnLofmqQ

NMS provides the modem with the NMS information of the remote modem. When building an options file, this data is automatically output through iBuilder.

[NMS]

timeout = 15
server_ip = 0.0.0.0
broadcast_ip = 0.0.0.0
keep_alive_port_number = 2860

NRD_server_ip = 0.0.0.0
NRD_remote_status_port_number = 2859
service_monitor_interval = 1000
download_monitor_group = 239.192.0.0
download_monitor_port = 9000
download_monitor_credentials = 1
is_nms_managed = 0
event_server_ip = 0.0.0.0
event_server_port = 2860

VLAN: Some modems have multiple ports on the back; the ports function as switches that can be separated into multiple VLANs. However, VLANs do not operate like normal-layer 3 Cisco switches. When VLANs are created through the satellite modem, the information is actually "VLANed" over the satellite instead of when it enters the satellite router.

[VLAN]
mode = 0
vid = 1

ETHO_1 is a very important aspect of options files; it contains the field that assigns the IP address to the modem IP configuration and the field that sets the subnet mask of the modem as follows:

- Address field: Assigns the IP address to the modem
- Netmask field: Sets the subnet mask of the modem
- Rip_enabled: Should be set to 1 but doesn't usually change**.**

[ETH0_1]
address = 192.168.2.1
netmask = 255.255.255.0
rip_enabled = 1

DNS_1 tells the modem the location of the DNS server, the cache time and the time-out period. The field "dns_forward_timeout" is measured in milliseconds, so "dns_forward_timeout = 2000" means that an accessed website will time out after 2 seconds.

[DNS_1]
dns_enable = 1
dns_primary_server_name = Primary DNS
dns_primary_server_addr = 192.168.2.1

dns_secondary_server_name = Secondary DNS
dns_secondary_server_addr = 8.8.8.8
dns_cache_size = 100
dns_cache_ttl_min = 300
dns_cache_ttl_max = 86400
dns_forward_queue_size = 1000
dns_forward_timeout = 2000

DHCP_1 either enables or disables the Dynamic Host Configuration Protocol (DHCP) mode on the satellite router's switch. Typically, DHCP is not enabled in USSOCOM's applications; the open switch ports can be used based on the open IP address that falls within the subnet mask of ETHO_1.

[DHCP_1]
dhcp_mode = 1
dhcp_lease_seconds = 43200
dhcp_lease_range = 192.168.2.2-192.168.2.10
dhcp_dns_server_ip = 192.168.2.1
dhcp_dns_server2_ip = 8.8.8.8
dhcp_gateway_ip = 192.168.2.1

ROUTE_1_0 tells the modem the satellite's route. In the example, it is labeled with the SAT0 interface, which is defined as "interface = sat0".

[ROUTE_1_0]
interface = sat0
network = 0.0.0.0
netmask = 0.0.0.0
gateway = 0.0.0.0
metric = 1

SAT0_1 is a sub-interface that creates the satellite's route, as well as the interface that will be "talking to" the iDirect hub and the PP.

[SAT0_1]
address = 10.10.10.2
netmask = 255.255.255.252
rip_enabled = 1

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ETHO provides management IP information; however, in the USSOCOM configuration all modem management is conducted through port ETH0_1 (ETH0 is not used).

[ETHO]

interface = ixp1
phy_count = 8

LAN assigns the IP address for the LAN, which also sets the default gateway for the DHCP server.

[LAN]

lan_ip = 192.168.2.1
lan_subnet_ip = 255.255.255.0
lan_gw_ip = 0.0.0.0

MODEM_PARAMETERS provides the modem with both receive and transmit parameters. (Receive [rx]: frequency, acquisition timeframe in milliseconds, data rate, FEC, and spectral inversion; Transmit [tx]: frequency, data rate, FEC, spectral inversion, initial acquisition power level.)

[MODEM_PARAMETERS]

data_port = 0
loopback = 0
interface_type = 0
rx_freq = 1050000000 (assigns the frequency range in L-band)
rx_acqrange = 600000 (assigns the acquisition time in ms)
rx_bitrate = 512000 (data rate the modem will be receiving)
rx_mode = 2
rx_modtype = 1
rx_fecrate = 15 (the FEC rate for the receive side)
rx_scram = 1
rx_diff = 0
rx_specinv = 0 (sets the spectral inversion, to ensure the frequency range is in L-band)
tx_freq = 1250000000 (transmit frequency in L-band)
tx_bitrate = 512000 (transmit data rate)
tx_mode =
tx_modtype = 1
tx_clksource = 0
tx_fecrate = 15 (sets the FEC rate for transmit side)
tx_scram = 1

tx_diff = 0
tx_specinv = 0 (sets spectral inversion to keep freq within L-band)
tx_power_in_dbm = -35.000000 (sets initial power level in dBm)
rx_fsd = 38749
tx_spreading_factor = 1 (sets the transmit spreading factor which is spread spectrum technique)
rx_spreading_factor = 1(sets the receive spreading factor)
is_demod2_active = 0

ODU tells the modem to either enable or disable the DC power and 10 MHz clock on both the transmit and receive lines. These are used to provide power and timing to the BUC and LNB respectively. ODU also enables or disables pulse width modulation (PWM) on the transmit side, which is used for the CW carrier.

[ODU]
music_present = 0
odu_rx_dc_power = 1(initializes the DC power to power the LNB)
odu_rx_10_mhz = 0 (initializes the 10 MHz reference clock for the LNB)
odu_tx_dc_power = 1 (initializes the DC power for the BUC or anything in the transmit path)
odu_tx_10_mhz = 1 (initializes the 10 MHz reference clock on the transmit side)
odu_disable_tx_pwm = 0 (disables the pulse width modulation)

Timeplan provides the FEC block for the transmit and receive side.

[TIMEPLAN]
fec_blocks_per_outroute_frame = 19
fec_blocks_per_inroute_frame = 19

SPOOF tells the modem how long to wait for packet acknowledgment, the size of the receive buffer and other IP-related acknowledgment characteristics.

[SPOOF]
spoof_debug_level = 0
spoof_passthru = 0
spoof_timeout = 100
spoof_oos_buffer_size = 32240
spoof_keepalive_timeout_ms = 6000

spoof_fwd_ack_ms_timeout = 200
spoof_fade_timeout = 9000000
spoof_reap_timeout = 480000
spoof_syn_timeout = 120000
spoof_max_sessions = -1
spoof_accel_connect = 1
spoof_accel_port = 80
spoof_retx_buffer_size = 52633
spoof_peer_retx_buffer_size = 52633
spoof_merge_on = 0
spoof_compression_on = 0

FREQ_TRANS provides the local oscillator for both the BUC (up_translation) and LNB (down_translation). **FREQ_TRANS** is represented in MHz.

Add **[FREQ_TRANS]** to **[tx_freq]** and **[rx_freq]** (under Modem_Parameters) to get the actual carrier frequency for the remote.
[FREQ_TRANS] + [tx_freq] and **[rx_freq]** (under Modem_Parameters) = actual carrier frequency for your remote.

[FREQ_TRANS]
down_translation = 10750.000000
up_translation = 13050.000000